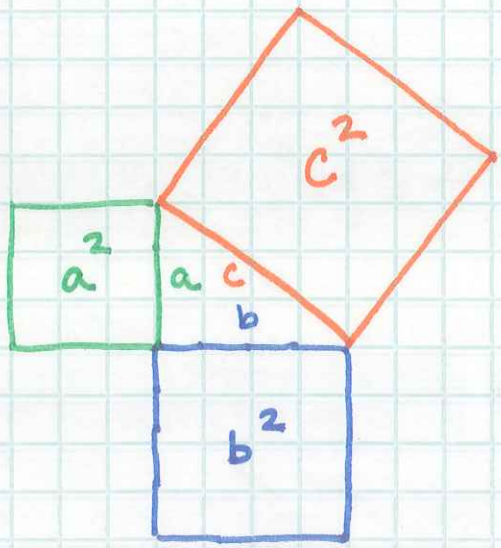
Pythagorean Theorem:

$$a^2 + b^2 = c^2$$

$$a + b \neq c$$



Ex: I have leg lengths that measure 3 and 4, what is my hypotenuse?

$a = 3$
$b = 4$
$c = c$

$$a^2 + b^2 = c^2$$
$$(3)^2 + (4)^2 = (c)^2$$
$$9 + 16 = c^2$$
$$25 = c^2$$
$$\sqrt{25} = \sqrt{c^2}$$
$$5 = c$$

The hypotenuse is 5 units.

Finding lengths of segments:

Length: 3 units

Length:

$a = 1$
$b = 2$
$c = c$

$$a^2 + b^2 = c^2$$
$$(1)^2 + (2)^2 = (c)^2$$
$$1 + 4 = c^2$$
$$5 = c^2$$
$$\sqrt{5} = \sqrt{c^2}$$
$$\sqrt{5} = c$$

Give me the value of c to the nearest thousandths place:

$\sqrt{5} \approx 2.236$

Rules about triangles:
- all triangles have three sides
- all three angles always add to equal 180°
- there are three types of triangles:
  - Based on side lengths:
    1. equilateral (a, a, a)
    2. isosclese (a, b, b)
    3. scalene (a, b, c)

  Base on angles:
    1. right
    2. acute
    3. obtuse

- right: $a^2 + b^2 = c^2$
- obtuse: $a^2 + b^2 < c^2$
- acute: $a^2 + b^2 > c^2$

- sides of a triangle: the two shortest sides must add to a sum GREATER ($\geq$) than the longest side.
  $a + b \geq c$

Conversions:

12 in = 1 ft

1 ft = $\frac{1}{3}$ yd

3 ft = 1 yd

36 in = 1 yd

3.82 yd

Convert to yards and ~~inches~~ feet to the nearest foot.

3 yd

$.82\ \cancel{yd} \times \frac{3\ ft}{1\ \cancel{yd}} = 2.46\ ft$

3 yards 2 feet

2.84 ft → put into feet and inches to the nearest inch.

2 ft

.84

$.84\ ft \times 12\ in = 10.08$

≈ 10 inches

2 ft 10 in